

Package ‘caverify’

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Type Package

Title Fast Strength-t Coverage Verification for Covering Arrays

Version 0.1.2

Description Verifies that an array covers every t-way interaction, the certificate check for covering arrays, using compiled C code with optional 'OpenMP' threading. Missing values are treated as wildcard ('`flexible"') entries that count as every symbol. Designed to be easy to embed in other packages: a single C file with a registered .Call entry point and one R wrapper.

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URL <https://github.com/chrispbsmolen/ca-tools>

BugReports <https://github.com/chrispbsmolen/ca-tools/issues>

Encoding UTF-8

Language en-US

Imports parallel

NeedsCompilation yes

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ca_verify

*Verify strength- t coverage of a covering array***Description**

Checks that an $N \times k$ array over v symbols covers every t -way interaction: for every choice of t columns and every one of the v^t value combinations, at least one row exhibits that combination. This is the certificate check for a covering array, run in compiled C at speeds suitable for large arrays and strengths.

Usage

```
ca_verify(x, t, v = NULL, threads = NULL, report = 10L)
```

Arguments

x	an integer matrix or data frame of integers; rows are runs, columns are factors. NA entries are wildcards ("flexible values") and count as every symbol.
t	interaction strength to verify (positive integer).
v	number of symbols per column; if NULL, inferred from the data range. Symbols may be coded $0 \dots v-1$ or $1 \dots v$; 1-based input is detected and shifted automatically.
threads	number of threads. NULL (the default) picks automatically: half the machine's logical cores, single-threaded for small jobs, capped during CRAN checks. Override with <code>options(caverify.threads = n)</code> or this argument. Long runs are interruptible without aborting R.
report	maximum number of missing-tuple examples to collect.

Value

An object of class `ca_verify`: a list with `covered` (logical), `colsets`, `gaps`, `missing_tuples`, `examples` (matrix; first t entries per row are 1-based column indices, the rest the missing value combination in the input coding), and `t`, `v`, `N`, `k`.

Examples

```
ca <- rbind(c(0,0,0), c(0,1,1), c(1,0,1), c(1,1,0))
ca_verify(ca, t = 2)           # a covering array of strength 2
ca_verify(ca[-1, ], t = 2)    # removing a run breaks coverage
```

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